ELEMENTARY
CORE Academy
UTAH STATE OFFICE OF EDUCATION & UTAH STATE UNIVERSITY

2008 Participant Handbook

UTAH STATE OFFICE OF EDUCATION
UtahState UNIVERSITY

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Organizations:

Utah State Office of Education (USOE)
Utah State University (USU)
State Science Education Coordination Committee (SSECC)
State Mathematics Education Coordination Committee (SMECC)
Special Education Services Unit (USOE)

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UTAH STATE OFFICE OF EDUCATION

Leadership…Service…Accountability

Patti Harrington, Ed.D. State Superintendent of Public Instruction
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Dear CORE Academy Teachers:

Thank you for your investment in children and in building your own expertise as you participate in the Elementary CORE Academy. I hope your involvement helps you to sustain a laser-like focus on student achievement.

Teachers in Utah are superb. By participating in the Academy, you join a host of teachers throughout the state who understand that teaching targeted on the core curricula, across a spectrum of subjects, will produce results of excellence. The research is quite clear–the closer the match of explicit instruction to core standards, the better the outcome on core assessments.

I personally appreciate your excellence and your desire to create wonderful classrooms of learning for students. Thank you for your dedication. I feel honored to associate with you and pledge my support to lead education in ways that benefit all of our children.

Sincerely,

Patti Harrington, Ed.D.
State Superintendent of Public Instruction

Funding Sources

Appreciation is expressed for the tremendous educational input and monetary commitment of several organizations for the successful delivery of the Elementary CORE Academy. This year's Elementary CORE Academy was developed and funded through a variety of sources. The Utah State Office of Education (USOE), in collaboration with Utah State University (USU) and local school districts of Utah, have supported kindergarten through sixth grade teachers with professional development experiences that will enhance the educational experience for Utah children.

Major funding for the Academy comes from the following sources:

Federal/State Funds:

Utah State Office of Education
- Staff Development Funds
- Special Education Services Unit

ESEA Title II

Utah Math Science Partnership

District Funds:

Various other sources including Quality Teacher Block, Federal ESEA Title II, and District Professional Development Funds.

School Funds:

Trust land, ESEA Title II, and other school funds

The state and district funds are allocations from the state legislature. ESEA is part of the "No Child Left Behind" funding that comes to Utah.

Additionally, numerous school districts, individual schools, and principals in Utah have sponsored teachers to attend the Academy. Other educational groups have assisted in the development and delivery of resources in the CORE Academy.

Most important is the thousands of teachers who take time during the summer to attend these professional development workshops. It is these teachers who make this program effective.

Goals of the Elementary CORE Academy

Overall

The purpose of the Elementary CORE Academy is to create high quality teacher instruction and improve student achievement through the delivery of professional development opportunities and experiences for teachers across Utah.

The Academy will provide elementary teachers in Utah with:

1. Models of exemplary and innovative instructional strategies, tools, and resources to meet the Core Curriculum standards, objectives, and indicators.
2. Practical models and diverse methods of meeting the learning needs of all children, with instruction implementation aligned to the Core Curriculum.
3. Meaningful opportunities for collaboration, self-reflection, and peer discussion specific to innovative and effective instructional techniques, materials, teaching strategies, and professional practices in order to improve classroom instruction.

Learning a limited set of facts will no longer prepare a student for real experiences encountered in today's world. It is imperative that educators have continued opportunities to obtain instructional skills and strategies that provide methods of meeting the needs of all students. Participants of the CORE Academy experience will be better equipped to meet the challenges faced in today's classrooms.

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Second Grade
Core Curriculum

K-2 Core Curriculum

Introduction

Most students enter school confident in their own abilities; they are curious and eager to learn more. They make sense of the world by reasoning and problem solving. Young students are active, resourceful individuals who construct, modify, and integrate ideas by interacting with the physical world as well as with peers and adults. They learn by doing, collaborating, and sharing their ideas. Students' abilities to communicate through language, pictures, sound, movement, and other symbolic means develop rapidly during these years.

- Young children learn by doing, collaborating, and sharing their ideas.

Literacy requires an understanding of listening, speaking, reading, writing, and viewing in many forms including print and electronic images. Today, more than ever, students must have the ability to think critically while applying new information to existing knowledge. Therefore, school literacy programs need to involve students in learning to read and write in situations that foster critical thinking and the use of literacy for independent learning in all content areas.

Young students are building beliefs about what mathematics is, about what it means to know and do mathematics, and about themselves as mathematical learners. Mathematics instruction needs to include more than short-term learning of rote procedures. Students must use technology and other mathematical tools, such as manipulative materials, to develop conceptual understanding and solve problems as they do mathematics. Students, as mathematicians, learn best with hands-on, active experiences throughout the instruction of the mathematics curriculum.

Language Arts and Mathematics are the tools for doing work in other areas. These content areas need to be integrated into other curriculum areas to provide students with optimal learning. The curriculum becomes more relevant when content areas are connected rather than taught in strict isolation. For this reason, the content areas of the Fine Arts, Health Education, Physical Education, Science, and Social Studies have been combined to enable teachers to teach more efficiently and students to learn in a real-life context that enhances lifelong learning.

The Kindergarten through Second Grade Core describes what students should know and be able to do at the end of each of the kindergarten, first, and second grade levels. It has been developed, critiqued, and revised by a community of Utah teachers, university

educators, State Office of Education specialist, and an advisory committee representing a wide variety of people from the community. The Core reflects the current philosophy of education that is expressed in national documents developed by the International Reading Association, National Council of the Teachers of Mathematics, National Standards for Arts Education, Information Power, National Association for Sport and Physical Education, American Association for the Advancement of Science, National Council for the Social Studies, International Society for Technology and Education, and Early Childhood Standards.

Organization of the K-2 Core:

- Intended Learning Outcomes
- Standard
- Objective
- Indicator

Organization of the K-2 Core

The Core is designed to help teachers organize and deliver instruction.

- Each grade level begins with a brief course description.
- The Kindergarten, First, and Second Grade INTENDED LEARNING OUTCOMES describe the goals for students to gain knowledge and understand their world. They are found at the beginning of each grade level, are an integral part of the Core, and should be included as part of instruction.
- The first Core area consists of the Language Arts curriculum.
- The second Core area consists of the Mathematics curriculum.
- The third Core area consists of the subject areas of the Fine Arts, Health Education, Physical Education, Science, and Social Studies.
- A STANDARD is a broad statement of what students are expected to understand. Several Objectives are listed under each Standard.
- An OBJECTIVE is a more focused description of what students need to know and be able to do at the completion of instruction. If students have mastered the Objectives associated with a given Standard, they have mastered that Standard at that grade level. Several Indicators are described for each Objective.
- An INDICATOR is a measurable or observable student action that enables one to assess whether a student has mastered a particular Objective. Indicators are not meant to be classroom activities, but they can help guide classroom instruction.

Guidelines Used in Developing the K-2 Core

The Core is:

Consistent With the Nature of Learning

The main intent in the early grades is for students to value learning and develop the skills to gain knowledge and understand their world. The Core is designed to produce an integrated set of Kindergarten, First, and Second Grade Intended Learning Outcomes for students, with specific goals in all content areas.

- By emphasizing depth rather than breadth, the Core seeks to empower students.

Coherent

The Core has been designed so that, wherever possible, the ideas taught within a particular grade level have a logical and natural connection with each other and with those of earlier grades. Efforts have also been made to select topics and skills that integrate well with one another appropriate to grade level. In addition, there is an upward articulation of concepts, skills, and content. This spiraling is intended to prepare students to understand and use more complex concepts and skills as they advance through the learning process.

Developmentally Appropriate

The Core takes into account the psychological and social readiness of students. It builds from concrete experiences to more abstract understandings. The Core focuses on providing experiences with concepts that students can explore and understand in depth to build the foundation for future learning experiences.

Reflective of Successful Teaching Practices

Learning through play, movement, and adventure is critical to the early development of the mind and body. The Core emphasizes student exploration. The Kindergarten, First, and Second Grade Intended Learning Outcomes are central in each standard. The Core is designed to encourage instruction with students working in cooperative groups. Instruction should recognize the importance of each Core area in the classroom, school, and community.

Comprehensive

The Kindergarten, First, and Second Grade Core does not cover all topics that have traditionally been in the Kindergarten, First, and Second Grade curriculum; however, it provides a basic foundation of knowledge and skills in all content areas. By emphasizing depth

rather than breadth, the Core seeks to empower students rather than intimidate them with a collection of isolated and eminently forgettable facts. Teachers are free to add related concepts and skills, but they are expected to teach all the standards and objectives specified in the Core for their grade level.

Feasible

Teachers and others who are familiar with Utah students, classrooms, teachers, and schools have designed the Core. It can be taught with easily obtained resources and materials. A Teacher Handbook is also available for teachers and has sample lessons on each topic for each grade level. The Teacher Handbook is a document that will grow as teachers add exemplary lessons aligned with the new Core.

- Student achievement of the standards and objectives in this Core is best assessed using a variety of assessment instruments.

Useful and Relevant

This curriculum relates directly to student needs and interests. Relevance of content areas to other endeavors enables students to transfer skills gained from one area of instruction into their other school subjects and into their lives outside the classroom.

Reliant Upon Effective Assessment Practices

Student achievement of the standards and objectives in this Core is best assessed using a variety of assessment instruments. Performance tests are particularly appropriate to evaluate student mastery of thinking processes and problem-solving skills. A variety of classroom assessment approaches should be used by teachers in conjunction with the Criterion Referenced Tests (CRT) that are administered to first and second grade students in Language Arts and Mathematics, and with the pre- and post-tests administered in kindergarten. Observation of students engaged in instructional activities is highly recommended as a way to assess students' skills as well as attitudes toward learning. The nature of the questions posed by students provides important evidence of their understanding.

Engaging

In the early grades, children are forming attitudes and habits for learning. It is important that instruction maximizes students' potential and gives them understanding of the intertwined nature of learning. Effective elementary instruction engages students actively in enjoyable learning experiences. Instruction should be as thrilling an experience for a child as seeing a rainbow, growing a flower, or describing a toad. In a world of rapidly expanding knowledge and technology, all students must gain the skills they will need to understand and function responsibly and successfully in the world. The Core provides skills in a context that enables students to experience the joy of learning.

The Second Grade Core Curriculum

Second grade core concepts should be integrated across all curriculum areas. Reading, writing, and mathematical skills should be emphasized as integral to the instruction in all other areas. Personal relevance of content is always an important part of helping students to value learning and should be emphasized.

In second grade, students are immersed in a literature-rich environment, filled with classical and contemporary fiction and nonfiction selections, which relate to all areas of learning and interest. Students listen and speak effectively in classroom discussions. They continue to work on fluency and expression and use a combination of strategies for reading and comprehension.

Second graders extend their study of number and spatial sense to include three-digit numbers students understand place value and number relationships in addition and subtraction and they model simple concepts of multiplication and division. They measure quantities with appropriate units. They classify shapes and see relationships among them by paying attention to their geometric attributes. They collect and analyze data and verify the answers.

In second grade, students learn about their relationship to the classroom, school, family, and community. Students develop the skills of questioning, gathering information, constructing explanations, and drawing conclusions. They learn basic body control while developing motor skills and moving in a variety of settings. Students become aware of strength, endurance, and flexibility in different parts of their bodies. They express thoughts and ideas creatively, while challenging their imagination, fostering reflective thinking, and developing disciplined effort and problem-solving skills.

- Reading, writing, and mathematical skills should be emphasized as integral to the instruction in all other areas.

K-2 Intended Learning Outcomes

- Intended learning outcomes provide a direction for general classroom instruction, management, culture, environment, and inclusion.

The main intent at the early grades is for students to value learning and develop the skills to gain knowledge and understand their world.

The Intended Learning Outcomes described below reflect the belief that kindergarten, first, and second grade education should address the intellectual, social, emotional, physical, and ethical development of children. While the Kindergarten, First, and Second Grade Core Curriculum focuses primarily on content and the intellectual development of children, it is important to create a classroom culture that fosters development of many aspects of a person. By nurturing development in these interrelated human domains, young people will be healthy and discover varied and exciting talents and dreams. They will be socially and civically competent and able to express themselves effectively.

The outcomes identified below are to provide a direction for general classroom instruction, management, culture, environment, and inclusion. These outcomes should be interwoven throughout the Kindergarten, First, and Second Grade Core Curriculum, which offers more specific and measurable standards for instruction.

Beginning in kindergarten and by the end of second grade students will be able to:

1. **Demonstrate a positive learning attitude.**
   a. Display a sense of curiosity.
   b. Practice personal responsibility for learning.
   c. Demonstrate persistence in completing tasks.
   d. Apply prior knowledge and processes to construct new knowledge.
   e. Voluntarily use a variety of resources to investigate topics of interest.
2. **Develop social skills and ethical responsibility.**
   a. Respect similarities and differences in others.
   b. Treat others with kindness and fairness.
   c. Follow classroom and school rules.
   d. Include others in learning and play activities.
   e. Participate with others when making decisions and solving problems.
   f. Function positively as a member of a family, class, school, and community.

3. **Demonstrate responsible emotional and cognitive behaviors.**
   a. Recognize own values, talents, and skills.
   b. Express self in positive ways.
   c. Demonstrate aesthetic awareness.
   d. Demonstrate appropriate behavior.
   e. Express feelings appropriately.
   f. Meet and respect needs of self and others.
4. **Develop physical skills and personal hygiene.**
   a. Respect physical similarities and differences in self and others.
   b. Learn proper care of the body for health and fitness.
   c. Develop knowledge that enhances participation in physical activities.
   d. Display persistence in learning motor skills and developing fitness.
   e. Use physical activity for self-expression.
5. **Understand and use basic concepts and skills.**
   a. Develop phonological and phonemic awareness.
   b. Decode, read, and comprehend written text and symbols.
   c. Develop vocabulary.
   d. Develop reasoning and sequencing skills.
   e. Demonstrate problem-solving skills.
   f. Observe, sort, and classify objects.
   g. Make and interpret representations, graphs, and models.
   h. Recognize how content ideas interconnect.
   i. Make connections from content areas to application in real life.
6. **Communicate clearly in oral, artistic, written, and nonverbal form.**
   a. Share ideas using communication skills.
   b. Predict an event or outcome based on evidence.
   c. Use appropriate language to describe events, objects, people, ideas, and emotions.
   d. Listen attentively and respond to communication.
   e. Use mathematical concepts to communicate ideas.
   f. Use visual art, dance, drama, and music to communicate.

Second Grade Language Arts Core Curriculum

Standard I:
Oral Language—
Students develop
language for
the purpose
of effectively
communicating
through listening,
speaking, viewing,
and presenting.

Standard I: Oral Language—Students develop language for the purpose of effectively communicating through listening, speaking, viewing, and presenting.

Objective 1: Develop language through listening and speaking. Identify specific purpose(s) for listening (e.g., to gain information, to be entertained).

a. Listen and demonstrate understanding by responding appropriately (e.g., follow multiple-step directions, restate, clarify, question, summarize).

b. Speak clearly and audibly with expression in communicating ideas.

c. Speak in complete sentences with appropriate subject-verb agreement.

Objective 2: Develop language through viewing media and presenting.

a. Identify specific purpose(s) for viewing media (i.e., to identify main idea and details, to gain information, distinguish between fiction/nonfiction).

b. Use a variety of formats (e.g., drama, sharing of books and personal writings, choral readings, informational reports, retelling experiences, and stories in sequence) in presenting with various forms of media (e.g., pictures, posters, charts, ads, newspapers).

Standard II: Concepts of Print—Students develop an understanding of how printed language works.

Objective 1: Demonstrate an understanding that print carries "the" message.

a. Recognize that print carries different messages.

b. Identify messages in common environmental print (e.g., signs, boxes, wrappers).

Objective 2: Demonstrate knowledge of elements of print within a text.

a. Discriminate between letters, words, and sentences in text.

b. Match oral words to printed words while reading.

c. Identify punctuation in text (i.e., periods, question marks, and exclamation points).

Standard II: Concepts of Print—Students develop an understanding of how printed language works.

Standard III: Phonological and Phonemic Awareness—Students develop phonological and phonemic awareness.

Objective 1: Demonstrate phonological awareness.

a. Count the number of syllables in words.

b. Count the number of syllables in a first name.

Objective 2: Recognize like and unlike word parts (oddity tasks).

a. Identify words with same beginning consonant sounds (e.g., man, sat, sick) and ending consonant sounds (e.g., man, sat, ten) in a series of words.

b. Identify words with same medial sounds in a series of words (e.g., long vowel sound: take, late, feet; short vowel sound: top, cat, pan; middle consonant sound: kitten, missing, lesson).

Standard III: Phonological and Phonemic Awareness—Students develop phonological and phonemic awareness.

Objective 3: Orally blend word parts (blending).

a. Blend syllables to make words (e.g., /ta/…/ble/, table).

b. Blend onset and rime to make words (e.g., /p/…/an/, pan).

c. Blend individual phonemes to make words (e.g., /s/ /a/ /t/, sat).

Objective 4: Orally segment words into word parts (segmenting).

a. Segment words into syllables (e.g., table, /ta/…/ble/).

b. Segment words into onset and rime (e.g., pan, /p/…/an/).

c. Segment words into individual phonemes (e.g., sat, /s/…/a/…/t/).

Objective 5: Orally manipulate phonemes in words and syllables (manipulation).

a. Substitute initial and final sound (e.g., replace first sound in mat to /s/, say sat; replace last sound in mat with /p/, say map).

b. Substitute vowel in words (e.g., replace middle sound in map to /o/, say mop).

c. Delete syllable in words (e.g., say baker without the /ba/, say ker).

d. Deletes initial and final sounds in words (e.g., say sun without the /s/, say un; say hit without the /t/, say hi).

e. Delete initial phoneme and final phoneme in blends (e.g., say step without the /s/, say tep; say best without the /t/, say bes).

Standard IV: Phonics and Spelling—Students use phonics and other strategies to decode and spell unfamiliar words while reading and writing.

Objective 1: Demonstrate an understanding of the relationship between letters and sounds.

a. Identify and pronounce all vowel diphthongs (e.g., oi, oy, aw, au) and consonant digraphs (e.g., ch, sh, th, wh) accurately in words.

b. Identify and pronounce sounds for short and long vowels, using patterns (e.g., cvc, cvvc, cvcv, cvc-silent e), and vowel digraphs (e.g., ea, ee, ie, oa, ai, ay, oo, ow) accurately in two-syllable words.

c. Identify and pronounce r-controlled vowel patterns in words (e.g., ar, or, er).

d. Identify and blend letter sounds to pronounce words.

Objective 2: Use knowledge of structural analysis to decode words.

a. Identify and read grade level contractions and compound words.

b. Identify sound patterns and apply knowledge to decode words (e.g., blends, digraphs, vowel patterns, r-controlled vowels).

c. Demonstrate an understanding of representing the same sound with different patterns by decoding these patterns accurately in isolation and in text (e.g., ee, ea, ei, e).

d. Use knowledge of root words and prefixes (e.g., re, un, mis) and suffixes (e.g., s, es, ed, ing, est, ly) to decode words.

e. Use letter and syllable patterns to pronounce multisyllabic words.

Objective 3: Spell words correctly.

a. Use knowledge of word families, patterns, and common letter combinations to spell new words.

b. Spell words with short and long vowel sounds, r-controlled words, words with consonant blends, consonant and vowel digraphs.

c. Spell an increasing number of grade level high-frequency and irregular words correctly (e.g., believe, answer).

d. Learn the spellings of irregular and difficult words (e.g., because, animals, before, answer, weight).

Standard IV: Phonics and Spelling—Students use phonics and other strategies to decode and spell unfamiliar words while reading and writing.

Objective 4: Use spelling strategies to achieve accuracy (e.g., prediction, visualization, and association).

a. Use knowledge about spelling to predict the spelling of new words.

b. Visualize words while writing.

c. Associate the spelling of new words with that of known words and word patterns.

d. Use spelling generalities to assist spelling of new words (e.g., one vowel between two consonants, silent "e" on the end of a word, two vowels together).

Standard V: Fluency—Students develop reading fluency to read aloud grade level text effortlessly without hesitation.

Objective 1: Read aloud grade level text with appropriate speed and accuracy.

a. Read grade level text at a rate of approximately 80 wpm.

b. Read grade level text with an accuracy rate of 95-100%.

Objective 2: Read aloud grade level text effortlessly with clarity.

a. Read grade level text in three- to four-word phrases using intonation, expression, and punctuation cues.

b. Read with automaticity 200 second grade high-frequency/ sight words.

Standard V: Fluency—Students develop reading fluency to read aloud grade level text effortlessly without hesitation.

Standard VI: Vocabulary—Students learn and use grade level vocabulary to increase understanding and read fluently.

Objective 1: Learn new words through listening and reading widely.

a. Use new vocabulary learned by listening, reading, and discussing a variety of genres.

b. Learn the meaning of a variety of grade level words (e.g., words from literature, social studies, science, math).

Standard VI: Vocabulary—Students learn and use grade level vocabulary to increase understanding and read fluently.

Objective 2: Use multiple resources to learn new words by relating them to known words and/or concepts.

a. Use multiple resources to determine the meanings of unknown words (e.g., simple dictionaries, glossaries).

b. Relate unfamiliar words and concepts to prior knowledge to increase vocabulary (e.g., liquid: milk, water, punch).

Objective 3: Use structural analysis and context clues to determine meanings of words.

a. Identify meanings of words using prefixes and suffixes (e.g., do/undo, write/rewrite, happy/happiness, help/helper/helpful).

b. Use context to determine meanings of unknown key words (e.g., The store clerk glared at the children as they looked at the toys.).

c. Use context to determine meanings of synonyms, antonyms, homonyms (e.g., sun/son) and multiple-meaning words (e.g., ring).

Standard VII: Comprehension—Students understand, interpret, and analyze narrative and informational grade level text.

Objective 1: Identify purposes of text.

a. Identify purpose for reading.

b. Identify author's purpose.

Objective 2: Apply strategies to comprehend text.

a. Relate prior knowledge to make connections to text (e.g., text to text, text to self, text to world).

b. Ask questions about text read aloud and independently.

c. Form mental pictures to aid understanding of text.

d. Make and confirm predictions while reading using title, picture clues, text, and/or prior knowledge.

e. Make inferences and draw conclusions from text.

f. Identify topic/main idea from text; note details.

g. Summarize important ideas/events; summarize supporting details in sequence.

h. Monitor and clarify understanding applying fix-up strategies while interacting with text.

i. Compile information from text.

Objective 3: Recognize and use features of narrative and informational text.

a. Identify characters, setting, sequence of events, problem/resolution.

b. Identify different genres: fairy tales, poems, realistic fiction, fantasy, fables, folk tales.

c. Identify information from pictures, captions, diagrams, charts, graphs, and table of contents.

d. Identify different structures in texts (e.g., compare/contrast, cause/effect).

e. Locate facts from a variety of informational texts (e.g. newspapers, magazines, books, other resources).

Standard VII: Comprehension—Students understand, interpret, and analyze narrative and informational grade level text.

Standard VIII: Writing—Students write daily to communicate effectively for a variety of purposes and audiences.

Objective 1: Prepare to write by gathering and organizing information and ideas (pre-writing).

a. Generate ideas for writing by reading, discussing literature and informational text, and reflecting on personal experiences.

b. Select topics from generated ideas.

c. Identify audience, purpose, and form for writing.

d. Use simple graphic organizers to organize information.

Objective 2: Compose a written draft.

a. Draft ideas on paper in an organized manner utilizing words and sentences (e.g., beginning, middle, end; main idea; details).

b. Use voice in writing (e.g., express feelings, opinions).

c. Select appropriate words to convey meaning.

Objective 3: Revise by elaborating and clarifying a written draft.

a. Revise draft to add details, strengthen word choice, and reorder content.

b. Enhance fluency by using complete sentences.

c. Revise writing, considering the suggestions of others.

Objective 4: Edit written draft for conventions.

a. Edit writing for capitals in names, first word of a sentence, and the pronoun "I", correct punctuation of sentence endings, greetings and closings of letters, dates, and contractions.

b. Edit for spelling of grade-level appropriate words.

c. Edit for standard grammar (e.g., subject-verb agreement).

d. Edit for appropriate formatting features (e.g., margins, indentations, titles).

Objective 5: Use fluent and legible handwriting to communicate.

a. Write demonstrating mastery of all upper- and lower-case manuscript letters and numerals using proper form, proportions, and spacing.

b. Increase fluency in forming manuscript letters and numerals.

c. Produce legible documents with manuscript handwriting.

Standard VIII: Writing—Students write daily to communicate effectively for a variety of purposes and audiences.

Objective 6: Write in different modes and genres.

a. Produce personal writing (e.g., journals, friendly notes and letters, personal experiences, family stories, literature responses).

b. Produce traditional and imaginative stories, narrative and formula poetry as an individual/shared writing activity.

c. Produce informational text (e.g., ABC books, how-to books, observations).

d. Produce writing to persuade (e.g., express opinions).

e. Produce functional texts (e.g., lists, labels, signs).

f. Share writing with others using illustrations, graphs, and/or charts to add meaning.

g. Publish four to six individual products.

Second Grade Mathematics Core Curriculum

By the end of grade two, students understand place value and number relationships in addition and subtraction and they model simple concepts of multiplication and division. They measure quantities with appropriate units. They classify shapes and see relationships among them by paying attention to their geometric attributes. They collect and analyze data and verify the answers.

Standard I: Students will acquire number sense with whole numbers and fractions and perform operations with whole numbers.

Standard I: Students will acquire number sense with whole numbers and fractions and perform operations with whole numbers.

Objective 1: Identify and represent the relationships among numbers, quantities, and place value in whole numbers up to 1000.

a. Represent whole numbers in groups of hundreds, tens, and ones using base ten models and write the numeral representing the set in standard and expanded form.

b. Identify the place and the value of a given digit in a three-digit numeral.

c. Represent the composition and decomposition of numbers in a variety of ways.

d. Compare and order numbers using the terms, greater than, less than, or equal to, and the symbols, >, <, and =, using various strategies, including the number line.

e. Identify and describe even and odd whole numbers.

Objective 2: Use unit fractions to identify parts of the whole and parts of a set.

a. Divide geometric shapes into two, three, or four equal parts and identify the parts as halves, thirds, or fourths.

b. Divide sets of objects into two, three, or four parts of equal number of objects and identify the parts as halves, thirds, or fourths.

c. Represent the unit fractions 1/2, 1/3, and 1/4 with objects, pictures, words (e.g., ___out of ___ equal parts), and symbols.

Objective 3: Estimate, model, illustrate, describe, and solve problems involving two- and three-digit addition and subtraction.

a. Demonstrate quick recall of addition facts (up to 10 + 10) and related subtraction facts.

b. Model addition and subtraction of two- and three-digit whole numbers (sums and minuends to 1000) in a variety of ways.

c. Write a story problem that relates to a given addition or subtraction equation, and write a number sentence to solve a story problem that is related to the environment.

d. Demonstrate fluency with two- and three-digit addition and subtraction problems, using efficient, accurate, and generalizable strategies that include standard algorithms and mental arithmetic, and describe why the procedures work.

e. Use the mathematical relationship between addition and subtraction and properties of addition to model and solve problems.

Objective 4: Model, illustrate, and pictorially record solutions to simple multiplication and division problems.

a. Represent multiplication with equal groups using concrete objects and skip counting by twos, fives, and tens.

b. Represent division as fair shares using concrete objects or pictures.

Mathematical language and symbols students should use:
number line, add, sum, subtract, difference, greater than, less than, equal to, >, <, =, even, odd, halves, thirds, fourths, 1/2, 1/3, 1/4.

Exploratory Concepts and Skills

- Investigate addition of common fractions (e.g., 1/2 + 1/2 = 1, 1/4 + 1/4 = 1/2).
- Investigate comparing fractions in terms of greater than, less than, and equal to.
- Understand situations that entail multiplication and division, such as equal groupings of objects and sharing equally.

Standard II: Students will model, represent, and interpret patterns and number relationships to create and solve problems with addition and subtraction.

Objective 1: Recognize, describe, create, and extend growing patterns.

a. Determine the next term in linear patterns (e.g., 2, 4, 6…; the number of hands on one person, two people, three people).

b. Construct models and skip count by twos, threes, fives, and tens and relate to repeated addition.

Objective 2: Model, represent, and interpret number relationships using mathematical symbols.

a. Recognize that "≠" indicates a relationship in which the two sides of the inequality are expressions of different numbers.

b. Recognize that symbols such as x, r, or ¯ in an addition or subtraction equation represent a number that will make the statement true.

c. Use the commutative and associative properties of addition to simplify calculations.

Standard II: Students will identify and use patterns and relations to represent mathematical situations.

Mathematical language and symbols students should use:
patterns, +, -, =, ≠

Exploratory Concepts and Skills
- Investigate situations with variables as unknowns and as quantities that vary.

Standard III: Students will understand simple geometry and measurement concepts as well as collect, represent, and draw conclusions from data.

Objective 1: Describe, classify, and create geometric figures.

a. Describe and classify plane and solid geometric figures (i.e., circle, triangle, rectangle, square, trapezoid, rhombus, parallelogram, pentagon, hexagon, cube, sphere, cone) according to the number of sides and angles or faces, edges, and vertices.

b. Compose and decompose shapes and figures by substituting arrangements of smaller shapes for larger shapes or substituting larger shapes for arrangements of smaller shapes.

c. Compose and decompose shapes and figures and describe the part-whole relationships, similarities, and differences.

Objective 2: Identify and use units of measure, iterate (repeat) that unit, and compare the number of iterations to the item being measured.

a. Identify and use measurement units to measure, to the nearest unit, length (i.e., inch, centimeter), weight in pounds, and capacity in cups.

b. Estimate and measure length by iterating a nonstandard or standard unit of measure.

c. Use different units to measure the length of the same object and recognize that the smaller the unit, the more iterations needed to cover a given length.

d. Determine the value of a set of up to five coins that total $1.00 or less (e.g., three dimes, one nickel, and one penny equals 36¢).

e. Tell time to the quarter-hour and sequence a series of daily events by time (e.g., breakfast at 7:00 a.m., school begins at 9:00 a.m, school ends at 3:00 p.m.).

Objective 3: Collect, record, organize, display, and interpret numerical data.

a. Collect and record data systematically, using a strategy for keeping track of what has been counted.

b. Organize and represent the same data in more than one way.

Standard III: Students will understand simple geometry and measurement concepts as well as collect, represent, and draw conclusions from data.

c. Organize, display, and label information, including keys, using pictographs, tallies, bar graphs, and organized tables.

d. Describe data represented on charts and graphs and answer simple questions related to data representations.

Mathematical language and symbols students should use:
inch, centimeter, pound, cup, circle, triangle, rectangle, square, trapezoid, rhombus, parallelogram, pentagon, hexagon, cube, sphere, cone, vertices, angle, face, edge, weight, length, capacity

Exploratory Concepts and Skills
- Use verbal instructions to move within the environment.
- Determine simple equivalencies of measurements.
- Conduct simple probability experiments.

Second Grade Fine Arts, Health, Physical Education, Science and Social Studies Core Curriculum

Standard I: Students will develop a sense of self.

Objective 1: Describe and adopt behaviors for health and safety.

a. Explain the importance of balance in a diet.

b. Distinguish communicable from noncommunicable diseases (e.g., chicken pox, common cold, flu; asthma, cancer, diabetes).

c. Relate behaviors that can help prevent disease (e.g., hand washing, good nutrition, fitness, universal precautions).

d. Identify the harmful effects of tobacco on self and others (e.g., death, heart and lung disease, shortness of breath).

e. Adopt basic safety habits (e.g., wear a seatbelt, practice bicycle safety, find adult help in an emergency).

Objective 2: Develop and apply skills in fine and gross motor movement.

a. Participate daily in sustained periods of physical activity that requires exertion (e.g., one to five* minutes of walking, jogging, jump roping).

b. Perform fundamental locomotor and nonlocomotor skills in movement sequences and game applications (e.g., walk-hop-skip, run-stretch-skate, run-hop-lay up).

c. Perform manipulative skills exhibiting a majority of correct technique components (e.g., soccer kick: eyes on ball, step with foot opposite to kicking foot, contact ball with inside of foot, follow through).

d. Identify components of physical fitness (i.e., strength, endurance, flexibility) and corresponding activities.

e. Create and perform unique dance movements and sequences that expand physical skills while demonstrating personal and spatial awareness.

Objective 3: Develop and use skills to communicate ideas, information, and feelings.

a. Express personal experiences and imagination through dance, storytelling, music, and visual art.

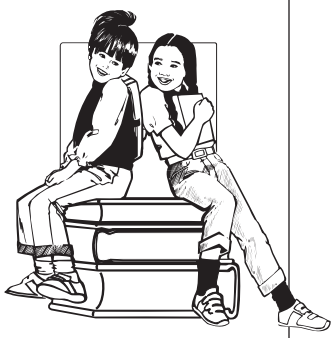
Standard I: Students will develop a sense of self.

b. Create, with improving accuracy, works of art depicting depth (e.g., close objects large, distant objects small) using secondary and tertiary colors.

c. Develop ability to sing in tune with relaxed strength and clarity.

d. Develop consistency in rhythmic accuracy of body percussion and instrument playing.

* Some students may not be able to sustain activity for one minute due to various medical concerns.



Standard II: Students will develop a sense of self in relation to families and community.

Objective 1: Describe behaviors that influence relationships with family and friends.

a. Describe characteristics of healthy relationships (e.g., caring, responsibility, trust, respect).

b. Identify benefits of cooperating and sharing.

c. Explain how families and communities change over time.

d. Recognize how choices and consequences affect self, peers, and family.

e. Identify behaviors that might create conflict situations and ways to resolve them.

Objective 2: Examine important aspects of the community and culture that strengthen relationships.

a. Explain why families, schools, and communities have rules.

b. Compare rural, suburban, and urban communities.

c. Relate goods and services to resources within the community.

d. Participate in activities that promote public good (e.g., respect cultural and ethnic differences, identify community needs) and recite the Pledge of Allegiance.

e. Recognize the positive and negative impact of media.

Objective 3: Express relationships in a variety of ways.

a. Describe traditions, music, dances, artwork, poems, rhymes, and stories that distinguish cultures.

b. Develop an acting ability to relate to characters' thoughts and feelings (e.g., needs, hopes, frustrations, fears) in stories and plays.

c. Create and perform/exhibit dances, visual art, music, and dramatic stories from a variety of cultures expressing the relationship between people and their culture.

Standard II: Students will develop a sense of self in relation to families and community.

Standard III: Students will develop an understanding of their environment.

Objective 1: Investigate relationships between plants and animals and how living things change during their lives.

a. Observe and describe relationships between plants and animals.

b. Describe the life cycle of local plants and animals using diagrams and pictures.

c. Create pictures and stories about real animals and compare them to make-believe stories about animals.

Standard III: Students will develop an understanding of their environment.

Objective 2: Observe and describe weather.

a. Observe and describe patterns of change in weather.

b. Measure, record, graph, and report changes in local weather.

c. Describe how weather affects people and animals.

d. Draw pictures and create dances and sounds that represent weather features (e.g., clouds, storms, snowfall).

Objective 3: Investigate the properties and uses of rocks.

a. Describe rocks in terms of the parts that make up the rocks.

b. Sort rocks based upon color, hardness, texture, layering, and particle size.

c. Identify how the properties of rocks determine how people use them.

d. Create artworks using rocks and rock products.

Objective 4: Demonstrate how symbols and models are used to represent features of the environment.

a. Identify and use information on a map or globe (i.e., map key or legend, compass rose, physical features, continents, oceans).

b. Use an atlas and globe to locate information.

c. Locate continents and oceans on a map or globe (i.e., North America, Antarctica, Australia, Africa, Pacific Ocean, Atlantic Ocean).

Facilitated

Activities

Name _____ District _____

Quadrant Partner

1.	2.
3.	4.

Partner Interviews

- Write 3 pieces of professional information about yourself.
- Write 2 pieces of personal information.
- Write 1 thing that you enjoy doing or at which you are particularly successful.
- Why did you sign up for CORE Academy?

Acrobats, Grandmas, and Ivan

Who will win the third round of the tug of war?

Round 1: On one side are 4 acrobats, each of equal strength. On the other side are 5 grandmas, each of equal strength. The result is dead even.

Round 2: On one side is Ivan, a dog. Ivan is pitted against 2 of the grandmas and 1 acrobat. Again, it's a draw.

Round 3: Ivan and 3 grandmas are on one side, the acrobats are on the other side.

Math - Problem Solving: Acrobats, Grandmas, and Ivan

CATEGORY	4	3	2	1
Mathematical Concepts	Explanation shows complete understanding of the mathematical concepts used to solve the problem(s).	Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s).	Explanation shows some understanding of the mathematical concepts needed to solve the problem(s).	Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written.
Explanation	Explanation is detailed and clear.	Explanation is clear.	Explanation is a little difficult to understand, but includes critical components.	Explanation is difficult to understand and is missing several components OR was not included.
Mathematical Reasoning	Uses complex and refined mathematical reasoning.	Uses effective mathematical reasoning	Some evidence of mathematical reasoning.	Little evidence of mathematical reasoning.
Neatness and Organization	The work is presented in a neat, clear, organized fashion that is easy to read.	The work is presented in a neat and organized fashion that is generally easy to read.	The work is presented in an organized fashion but may be hard to read at times.	The work appears sloppy and unorganized. It is hard to know what information goes together.
Checking	The work has been checked by two classmates and all appropriate corrections made.	The work has been checked by one classmate and all appropriate corrections made.	Work has been checked by one classmate, some corrections were not made.	Work was not checked by classmate OR no corrections were made based on feedback.

Hallmarks of a Differentiated Classroom

Differentiation in Practice, Tomlinson, Eidson

Task: Read each of the hallmarks of a differentiated classroom. Decide if it is something you do always, frequently, sometimes, rarely or never. This is just for you, so be completely honest. When you finish, think of a time in your teaching when you used or implemented any one of these hallmarks. Write briefly about it in your journal. Describe the situation. What were you teaching? Which student(s) did you differentiate for? Why? What, if any, were the challenges? What did you do? What happened?

A - always
F - frequently
S - sometimes
R - rarely
N - never

_____The teacher is clear about learning goals.

I know and understand the concepts and procedures in my grade level math core. I clearly identify what I want my students to know, understand and be able to do before beginning a unit of study. I communicate these learning goals clearly to my students and regularly refer to them as I move through a unit of study.

_____There is a strong link between assessment and instruction.

I comfortably and strategically use a combination of diagnostic, formative and summative assessments to determine what my students know, understand and are able to do. Throughout a unit of study I assess my students formally and informally and use the information to adjust my instruction as my students work to achieve each learning goal.

_____The teacher groups students flexibly.

I use a variety of student groupings in my math instruction including large group, small group and student partners. At times I strategically group students heterogeneously or homogeneously based on readiness, interest level or learning style to best achieve the learning goal(s).

_____The teacher uses time, space, and materials flexibly.

I may modify my time, physical space or materials based on students' readiness level, interest or learning style.

_____The teacher involves her students in understanding the nature of the classroom and in making it work for everyone.

I involve my students in establishing and maintaining classroom rules, which include showing respect for all learners and supporting each other in working toward the learning goals. My students understand that I am interested in all students being successful in mathematics learning and that I may adapt learning situations or materials to create conditions for students to be successful.

_____The teacher emphasizes individual growth as central to the success of the classroom.

I expect my students to be responsible (as much as possible) for their progress and mathematics learning. My students understand that we are partners in their learning. Students work toward goals that are personally challenging instead of competing against each other.

_____The teacher works to ensure that all students have respectful work.

I provide learning experiences that allow students to participate in mathematics in a way that builds their self esteem and respects their differences as learners. My students know that success in mathematics depends on their efforts and level of engagement with the content. Hard work is encouraged and valued.

_____The teacher makes sure differentiation is always a "way up," never a "way out."

I never "dumb down" the math curriculum. Instead, I support my students as they reach toward achieving mastery of grade-level math content.

_____The teacher sets her own sights high, just as she asks her students to set their sights high.

I know that I am also a learner. I actively seek out information and opportunities to improve my teaching, just as I expect my students to improve their learning. I expect my students to do their best work and to set goals for themselves, and I hold myself to the same standard.

_____The teacher seeks specialists' active partnership in her classroom.

I collaborate with and/or include specialists when appropriate to help me meet the needs of each of my students. When specialists are involved with my students on a regular basis, I take time to communicate with them so they know what math content we are working on and what our learning goals are. We share information with each other about individual student progress.

_____The teacher's differentiation is largely proactive rather than reactive.

I know my students. I plan in advance to address the readiness, learning styles and interests of my students in my math instruction; although I do realize there are times when on-the-spot adjustments must be made.

Use your journal or this space provided to write about a time when you used or implemented one of these hallmarks of differentiation.

Use these questions in the next activity.

Group discussion questions:

a. What is similar and/or different about your experiences?

b. How might the outcome have been different if you had not differentiated in your classroom?

c. What, if anything, would you do differently now?

Shape Up Center Time Instructions

Each center has two activities. Please choose one of the activities for each center to complete in your journal. Indicate which activity you completed by circling the corresponding shape.

Hexagon Center "Today the Weather Makes Me Feel _____." Think of how the weather makes you feel today. Choose the emotion that best describes your feeling and write a short poem in your journal describing it. Title your poem, "Today The Weather Makes Me Feel _____." OR Think of how the weather makes you feel today. Choose the emotion that best describes your feeling and draw a picture of yourself in your journal depicting your emotion. Title your picture, "Today I Feel _____."	Trapezoid Center Dramatic Storytelling: Cinderella Your Way Create your own version of this classic tale, reflecting your culture. Change a character or add a new one. Give your story a new setting. Change what the main character leaves behind. Instead of a glass slipper, what will it be? Write your story on a separate piece of paper. OR Create your own version of this classic tale, reflecting your culture. Change the name of a character. Give your story a new setting. Change what the main character leaves behind. Instead of a glass slipper, what will it be? Act out your story.
Pentagon Center Creating Shapes Select a shape from the pocket chart and practice creating that shape in the box of sand. Practice each shape two times then select another shape until all cards have been chosen. OR Select a shape from the pocket chart and build that shape using the pattern blocks. After you build each shape, transfer your pattern to your journal.	Rhombus Center Use an Addition or Subtraction Equation to Create a Story Problem Choose a number sentence from the box or make your own. Draw a picture to tell a story that represents that equation. Write your story in your journal. OR Choose a number sentence from the box or make your own. Draw a picture to tell a story that represents that equation. Tell your story to a partner.

Multiple Intelligences/Learning Styles

Children think, learn and create in a myriad of different ways. Howard Gardner's model of multiple intelligences recognizes the broad range of talents and learning styles we find in our students. Within his model, Gardner identified and categorized eight different intelligences: Verbal/linguistic, logical/mathematical, bodily/kinesthetic, intrapersonal, interpersonal, musical/rhythmic, visual/spatial, and naturalistic. According to Gardner, every child possesses each of these intelligences, but some are developed more than others, depending on the individual. Teachers can take these categories and differentiate curriculum through the preparation of activities that nurture these intelligences in students. Indeed, the development of each child's potential is directly influenced by how effectively teachers match what students learn with how they learn (their own particular intelligences).

It is recommended that teachers use the eight multiple intelligences as a springboard to create activities that challenge students to take control of their own learning. Making students aware of the different intelligences will help them identify how they learn best and also which methods challenge them. Teachers can target activities that lead students to enhance both their strengths and weaknesses.

Indeed, educators can think of multiple intelligences as a philosophy of how children learn. University of California—Riverside's Sue Teele describes the goal of Gardner's model in this way: "Multiple intelligences provide for different windows into the same room. We need to unleash the creative potential in all our schools in order to open as many windows as possible for every student in every classroom to succeed . . .the future mandates that we all move forward together in a way that builds on both our mutual strengths and respects our unique differences."

Teele's research suggests that certain intelligences are stronger in students, depending on their stages of development. Using a survey she developed (the "Teele Inventory for Multiple Intelligences") Sue studied the learning preferences of more than 6,000 students. Her findings revealed that the verbal/linguistic intelligence is strongest in students in kindergarten through third grade. First through fourth grade students show a definite preference for the logical/mathematical intelligence. The visual/spatial and bodily/kinesthetic intelligences are dominant throughout both elementary and middle school. Middle school students also show a preference for the musical/rhythmic and interpersonal intelligences. Based on Teele's findings, elementary school teachers would be well advised to plan lessons that incorporate the use of verbal/linguistic, logical/mathematical, visual/spatial and bodily/kinesthetic activities.

Here are a few considerations for educators as they strive to create activities based on the different learning styles of their students:

- Change it up. Educators should choose activities that target varied intelligences. Since teachers tend to plan lessons and activities that fit their own learning preferences, it's important for them to self-assess and to be sure that all of the intelligences are being represented.
- Be clear. When differentiating the "product," teachers need to be sure that students have clear directions (task cards, or posted instructions). Also, routines/procedures

should be established for students so they know how/where to find materials and who/when to ask for help.

- Be realistic. It's not necessary or appropriate for teachers to use all eight intelligences in every lesson. During the planning phase, the Core Curriculum and unique needs of the students should be considered to determine which two or three to incorporate.
- Remember to reflect. Best practice suggests that after trying something new, professionals take time to reflect, including making notes of what to retain and what to refine.
- All in good time. It can be overwhelming for teachers to create activities that incorporate the multiple intelligences in every single lesson for every content area. Common sense suggests to start with "baby steps" and consult with colleagues for ideas throughout the process.
- Communicate with parents. Both students and their parents will appreciate the insights that come from recognizing and putting a name to their unique learning styles. In fact, teachers can invite parents to help students identify their preferences by sending home a Learning Preferences Survey to be completed by students and parents together (each horizontal row represents a learning style/intelligence).

References:

Conklin, W. (2008). Applying Differentiation Strategies. (pp. 149-202). Huntington Beach, CA: Shell Education.

Teele, S. (1994). Redesigning the educational system to enable all students to succeed. Doctoral dissertation, University of California—Riverside.

Tomlinson, C.A. (1999). The Differentiated Classroom. (p. 83). Alexandria, VA: ASCD.

Resources:

http://www.thomasarmstrong.com/multiple_intelligences.htm

http://en.wikipedia.org/wiki/Multiple_Intelligences

Gardner's Eight Multiple Intelligences

Intelligence	Student Likes	Student Needs
Verbal/Linguistic "word smart" The student thinks in words.	Words: Writing, reading, playing word games, telling interesting stories	journals, books, writing materials
Logical/Mathematical "number/reasoning smart" The student thinks by reasoning.	Numbers or logic: Figuring out problems, puzzles, experimenting, calculating	science supplies, trips to museums, math manipulatives
Visual/Spatial "picture smart" The student thinks in pictures.	Pictures: Drawing, designing, doodling	art supplies, building materials, video equipment, puzzles
Bodily/Kinesthetic "body smart" The student thinks by using his/her body.	A physical experience: Dancing, moving, jumping, running, touching	movement, sports, theater, physical games, hands-on activities
Rhythmic/Musical "music smart" The student thinks in melodies and rhythms.	Music: Listening to music, making own music, tapping to the rhythm, singing	musical instruments, concerts, a karaoke machine
Interpersonal "people smart" The student thinks by talking about his/her ideas to others.	A social experience: Organizing events, being the leader, partying, mediating between friends	time with friends, group projects, social events
Intrapersonal "self-smart" The student keeps his/her thoughts to him/herself.	Self-reflection: Setting goals, mediating, daydreaming, quiet places	time alone, individualized projects
Naturalist "nature smart" The student thinks by classifying.	An experience in the natural world: Studying anything in nature including rocks, animals, plants, and the weather	time outside, nature hikes, telescopes, binoculars, notebooks for classification

Learning Preferences Survey

Dear Parents/Guardians,

It is an honor to be teaching your child, along with a whole class of unique and wonderful second-graders! Knowing my students' learning styles will help me plan and prepare learning experiences to enhance their natural talents/interests and to encourage the development of additional skills.

Please take a moment to complete this survey with your child. Thank you for your time. It is a pleasure to work with you!

Sincerely,

Directions: Read each box. Highlight with a crayon/pen/marker to identify the ones your child likes.

reading stories	writing stories	telling stories	spelling	doing word searches	word games
math problems	counting	playing checkers	measuring things	making graphs	science experiments
puzzles	drawing	painting	making sculptures	looking at maps	building blocks
playing sports	hiking	acting	moving around	dancing	running
playing instruments	humming tunes	writing songs	listening to music	singing	clapping rhythms
playing games with others	group work	being the leader	talking to people	talking on the phone	planning parties
keeping a journal	setting goals	quiet time for thinking	time alone	reading alone	daydreaming
animals	nature	learning about weather	watching animals	the outdoors	plants

Tiered Activities

Using tiered lessons is a way for teachers to ensure that all students, regardless of ability level or learning style, progress towards mastery of learning goals and objectives. Tiered assignments, also known as scaffolding, allow for differing levels of readiness and performance levels. The entire class works toward the same essential understanding (parallel tasks) but their paths to that goal depend upon their abilities and learning styles (varied levels of depth and varied degrees of support).

The following are guidelines for planning tiered lessons/assessments. Teachers should:

1. Using the Core Curriculum, pick a concept or skill that needs to be learned (e.g. "What's the ultimate measurable objective?").
2. Think of an activity that matches the objective.
3. Use pre-assessment data to determine the individual needs of the students. Consider students performing above grade level, students below grade level, English Language Learners, and students with varying learning style preferences (multiple intelligences).
4. Take another look at the selected activity. Target its complexity to be appropriate for on-grade-level learners.
5. Modify the activity or assessment to meet the needs of the other learners in the class. Within one activity, there will be several tiers to meet the wide range of student needs.
6. Seek consultation from the specialists in the school, as well as fellow colleagues.
7. Teach the activity, including the various tiers.
8. Reflect and refine.

Remember, tiered lessons provide differentiation because of varied levels of complexity, not necessarily because of varied quantities of work. Here are a few considerations for educators, as they implement use of tiered activities to scaffold for student learning:

- Just because students are above grade level, that does not mean they should be given more work.
- Just because students are below grade level, that does not mean they should be given less work.
- All tiered activities should be interesting and appealing.
- All tasks should provide a challenge.

Conklin, W. (2008). *Applying Differentiation Strategies.* (pp. 149-202). Huntington Beach, CA: Shell Education.

McCombs, B.L. (1995). *Understanding the keys to motivation to learn.* Noteworthy Perspectives: What's Noteworthy on Learners, Learning, and Schooling.

Tomlinson, C.A. (1999). *The Differentiated Classroom.* (p. 83). Alexandria, VA: ASCD.

Math I-3

Activities

Addition (2-3 Digit)

Addition – There's More than One Way to Solve a Problem!

Standard I:

Students will acquire number sense with whole numbers and fractions and perform operations with whole numbers.

Objective 3:

Estimate, model, illustrate, describe, and solve problems involving two- and three-digit addition and subtraction.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
2. Develop social skills and ethical responsibility.

Content Connections:

Language Arts I-1; Develop language through listening and speaking
Language Arts VIII-6; Produce informational text

Math Standard I

Objective 3

Connections

Background Information

Flexible or invented methods of computation require a student to have a good understanding of place value, compatible numbers, and operations and properties of the operations. Invented methods require students to take apart and combine numbers in a variety of ways. Students have to use their number sense to solve problems, and look at numbers as a composite number rather than a single digit. Invented strategies rely on the students' understanding. Students who have an opportunity to work with invented strategies will have an easier time understanding the traditional algorithm. Research shows that students that are taught the standard algorithms too early use the algorithms as a substitute for thinking and common sense.

There are many different inventive strategies for addition, but in this lesson we will discuss three different ways that students often use to solve problems. The first strategy will be referred to as "Expanded Form." Students write the numbers in expanded form first and then add the different place values. The answers from each of the places are then added together.

Example: $36 \rightarrow 30 + 6$ 80

$+ \underline{57} \rightarrow \underline{50} + \underline{7}$ $+ \underline{13}$

$80 \quad 13$ 93

The second strategy will be called "Partial Sums." In this strategy students still think about the numbers as composite numbers and not just digits. Students can start to add with the ones place or the hundreds place, but they must remember that they are adding 200 plus 300 not 2 plus 3 when they record their answers.

Example: 36
+ 57
80
+ 13
93

The third strategy we will discuss will be named "Opposite Change." Students should be familiar with "making tens" as a strategy for adding basic addition facts. In this strategy students subtract or add from one of the numbers to make compatible numbers, usually tens because they are easier to add. Whatever operation I use on the first addend, I have to use the opposite operation on the second addend to keep the problem the same.

Example: 36 - 3 Think: Because I added 3 to 57, I have to subtract 3 from 36 to keep the problem the same. 36 subtract 3 is 33.

+ 57 + 3 Think: if I add 3 to 57 it will make it 60.

33
+ 60
93

Research Basis

Burns, M., (November 07). Nine Ways to Catch Kids Up: How do we help floundering students who lack basic math concepts? *Educational Leadership*. 65(3) 16-21.

In this article, Marilyn Burns discusses nine essential strategies that help struggling mathematics learners become successful. Although all of the strategies are helpful, there are two strategies that I would like to focus on. The first strategy is building a routine of support. Burns discusses a four-stage lesson process that supports the students' learning and understanding of the concept before they are asked to work independently. Secondly, she discusses the importance of fostering student interaction with each other about their math knowledge either through sharing with the whole class, partners, or table groups.

Strong, R., Thomas, E. Perini, M. & Silver, H. (February 2004). Creating a Differentiated Mathematics Classroom. *Educational Leadership*. 61(5) 73-78.

The researchers in this article state that students acquire math using four different styles. Although students can work in all four styles, most find one or two styles comfortable and work within them. The four styles are: Mastery, Understanding, Interpersonal, and Self-Expressive. The authors also explain the importance of using the nine effective teaching strategies. Mathematical differentiation and students'

achievement can take place when educators design units that include all four dimensions of mathematical learning, use a variety of teaching strategies and create assessments that correspond with the learning styles.

Invitation to Learn

Write the following story problem on the board and ask students to solve the problem using base ten blocks or any other method that they choose. Problem: Chelsea bought 26 pieces of bubblegum and 19 jawbreakers at the store. How many pieces of candy did she have altogether? After students have had an opportunity to solve the problem using their manipulatives, ask students to share how they solved the problem. Did some of the students use similar methods? Do the strategies make sense to other students? Write the steps on the board as students explain their methods.

Materials

- ❑ Addition/Subtraction Mats
- ❑ Base Ten Blocks
- ❑ *Spin and Add*
- ❑ Transparent spinners
- ❑ Math journals

Instructional Procedures

Directions to make an Addition/Subtraction Mat

1. Divide a 11" X 14" piece of cardstock on the 14" side into four sections each measuring 3 ½".
2. Draw lines with a black marker to separate the four sections.
3. Glue a 3 ½" X 11" piece of colored cardstock in the third section.
4. Label the sections as follows: 1) First Addend 2) Second Addend 3) Thinking Area (different color cardstock) 4) Sum.
5. Turn the cardstock over to make the subtraction mat. Divide the cardstock into four 3 ½" sections.
6. Glue a 3 ½" X 11" piece of colored cardstock in the second section.
7. Label the sections as follows: 1)Minuend 2)Thinking Area 3)Subtrahend 4)Difference.

First Addend	Minuend
Second Addend	Thinking (different color)
Thinking (different color)	Subtrahend
Sum	Difference

Partner Spin and Add

1. Organize students into partner groups. Pass out an *Addition/ Subtraction Mat* to each student. To each partnership, pass out base ten blocks and a Spin and Add template with a transparent spinner. Students need their math journals to record their strategies.
2. Have each player spin the spinner. The highest number goes first.
3. The first student spins the spinner, and both students model the number using their base ten blocks on their *Addition/Subtraction Mat*.
4. The second student spins the spinner and again both students model the number on their mats using the base ten blocks.
5. Each player writes the equation in his/her journal and then writes or draws pictures explaining how he/she solved the problem. Students share their answer and method with each other. If students get the same answer they celebrate and continue with a new problem. If they get different answers then they need to go back and work the problem out together.
6. When students have completed the activity and cleaned up their materials, have them bring their journals with them to the rug for math meeting. Call on students to share some of their solution strategies with the other students by either drawing on the whiteboard or verbally explaining.

Materials

- ❑ *Addition Strategies Foldable*
- ❑ Scissors

Two and Three Digit Addition Strategies

1. Pass out the *Addition Strategies Foldable* to each student. Explain how to fold the paper and where to cut the flaps.
2. Model together an addition problem using "expanded form." Then, have the students make up a problem on their own, write it on the opposite side of the flap, and solve it using the same method. Continue using "partial sums," and "opposite change" strategies.

Materials

- ❑ Math journals
- ❑ Place Value cubes

Partner Roll and Add

1. Organize your students into partner groups. Pass out both a tens and a ones number cube to each partnership.
2. Students take turns rolling both cubes to create a two-digit number. After both numbers have been created then the students write the addition equation in their journals.

3. Have the students practice solving the problems using expanded form, partial sums, or opposite change strategies for addition.

Assessment Suggestions

- Walk around the room while students are participating in the activities. Are they able to model the numbers correctly? Do they understand place value, and are they lining up their equations properly? Are they able to solve the problems? What strategies are they using most often?
- Ask a partner group to explain their thoughts and strategies to you.
- Look at students' journals and evaluate their work to see where students are struggling.

Curriculum Extensions/Adaptations/ Integration

- Provide larger numbered spinners or a hundreds place cube for advanced learners during these activities.
- Provide smaller numbered spinners and allow learners with special needs to continue using manipulatives to assist them in solving the problems.
- Have special needs students orally explain their thought process to you if writing is a struggle.

Family Connections

- Write a note home to family members explaining that you will be teaching to their children different strategies for addition before you teach the standard algorithm. Give parents some examples and ask them to support you by helping their children learn these strategies too.
- Have students take a copy of the Spin and Add spinner home and play with a family member using an assigned strategy.

Additional Resources

Books

Principles and Standards for School Mathematics, by National Council of Teachers of Mathematics; ISBN 9 780873534802

Developing Number Concepts; Place Value, Multiplication, and Division, by Kathy Richardson; ISBN 0-7690-0060-6 21882

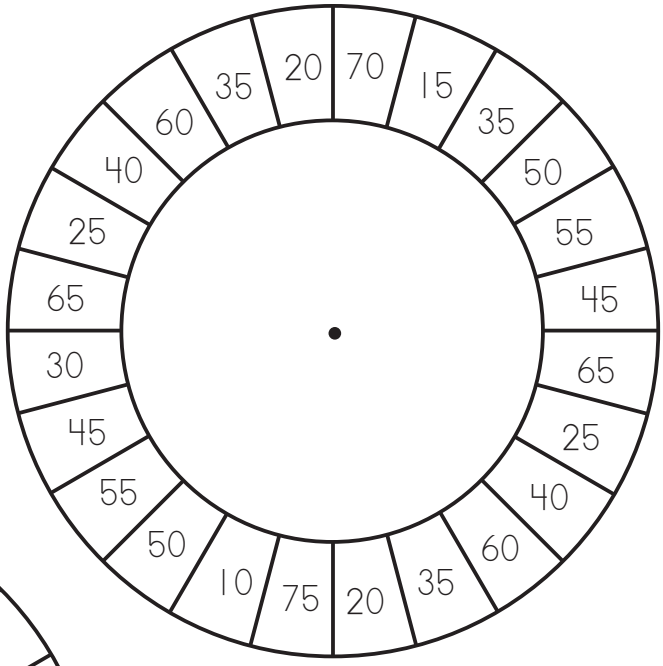
Elementary and Middle School Mathematics; Teaching Developmentally, by John A. Van De Walle; ISBN 0-205-38689-X

Mall Mania, by Stuart Murphy; ISBN 978-0-06-055777-5

Mission Addition, by Loreen Leedy; ISBN 0-8234-1412-4

A Fair Bear Share, by Stuart Murphy; ISBN 0-06-446714-7

Spin and Add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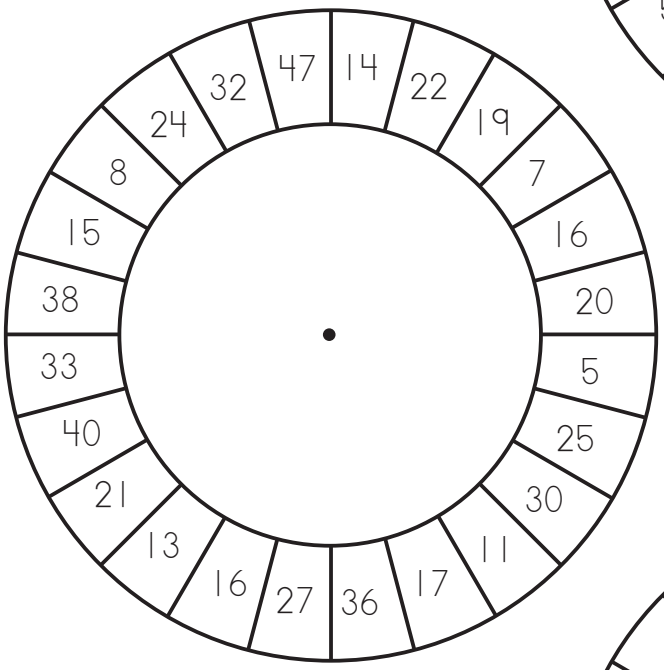
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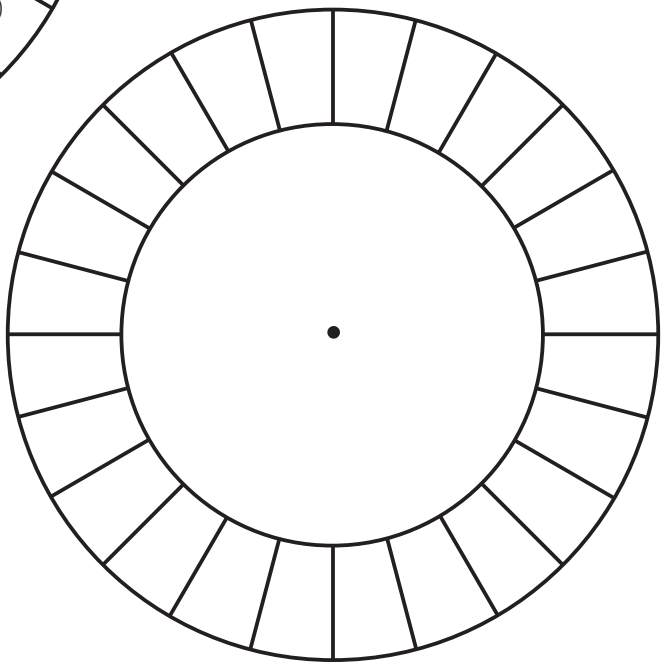


Addition Strategies	Opposite Change	Partial Sums	Expanded

Subtraction – Strategies in Action!

Standard I:

Students will acquire number sense with whole numbers and fractions and perform operations with whole numbers.

Objective 3:

Estimate, model, illustrate, describe, and solve problems involving two- and three-digit addition and subtraction.

Intended Learning Outcomes:

5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal forms.

Content Connections:

Language Arts VIII-6; Produce informational text
Language Arts I-1; Develop language through listening and speaking

Math Standard I

Objective 3

Connections

Background Information

Research has shown that children, if given the opportunity will invent several strategies to solve subtraction problems. The first step in teaching subtraction should include manipulatives in whole and small group instruction. This step is sometimes referred to as direct modeling, because the manipulatives directly model the meaning of an operation or story problem. This phase of instruction should be repeated several times, varying the steps and problems. Students should have plenty of opportunities to discuss with the class how they solved problems. This step is an added benefit to the teacher because he/she can listen to students to see if they fully understand the operation of subtraction.

After students are able to solve problems using manipulatives, a second step should be introduced. Students should then apply their invented strategies to problems and use writing or drawings to support their methods. It is usually helpful if teachers model record keeping techniques while students explain their thinking in whole group situations. In this step, it is also vital that students have the chance to share their thinking processes with one another.

As an educator, you want your students to be successful with one or two strategies that make sense to them. The two invented strategies that will be introduced in the lesson are "Counting Up" and "Same Change." Counting Up is a natural strategy for students to use, because many of them solve basic subtraction facts using this method. An example would be 13 – 5 =? Students think 5 plus what number equals 13? When a student uses this strategy with larger numbers, he/she has to break the steps into smaller pieces.

Example: 94 – 28. The student would think, "28 plus what number equals 94". He/she would start by counting on to 28, 29, 30 (plus 2). Then count by tens to get to 90. 30, 40, 50, 60, 70, 80, 90 (plus 60), and continue by ones, 90, 91, 92, 93, 94 (plus 4).

2 94-28 = 66

60

+ 4

66

The Same Change strategy works on the basis that as long as we keep the same distance between the numbers we are subtracting the answer will be the same. Examples: 5-3=2, add 5 to each number, 10-8=2, subtract 1 from each number, 4-2=2. With larger numbers we want students to use compatible numbers that are easier to subtract, usually numbers in the tens group.

Example: 94

-28

The student would think, "I add two to 28 and make it 30, an easier number to work with. Because I added 2 to 28, I have to make the same change to 94 so that the numbers stay the same distance from each other and the problem stays the same. 94 plus 2 equals 96. Now I can subtract."

96

- 30

66

Finally, you can introduce the traditional algorithm for subtraction but remember the importance of students being able to explain to you why it works.

Research Basis

Burns, Marilyn (April 2004). 10 Big Math Ideas. *Instructor Magazine*. 16-19.

In this article, Marilyn Burns describes ten "Big Ideas" that every math class should include. She explains that success comes from understanding, and to foster students' understanding, they need to explain their thinking to each other as well as write down their thoughts about mathematics. Mathematics should be presented in a real-world context so that it has meaning for our students. Manipulatives should be used to help make abstract ideas concrete. Our activities need to meet the needs of all of our learners, and as educators we need to remember that confusion and partial

understanding are natural to the learning process. She reminds educators that learning should be a long-term goal not a lesson objective. Finally, Burns says that there's no one-way to think about any mathematical problem. Always encourage students to share their thoughts and ideas of how to solve problems.

Tomlinson, Carol Ann. (Oct 2003). Deciding to Teach Them All. *Educational Leadership*. 61 (2) 6-11.

In this article, Carol Ann Tomlinson talks about principles that can be applied to academically diverse classrooms to help every learner succeed. She states that a teacher's first job is to provide an inviting and thoughtful curriculum. Each student should be required to think at high levels, and should find his or her work challenging and interesting. Students should have an opportunity to work together as a whole class and in various small groups. Tomlinson warns against grouping students in only a few ways, because students tend to see themselves and others in limited ways. Assessment should be an ongoing process in the classroom, with everything that a student says or does being potential assessment data. Lastly, for a class to be equitable for all learners, students should be graded on their growth as a learner.

Invitation to Learn

Make an overhead of compatible pairs to make 10 and another one to make 20, or make a copy for each student. Have students raise their hands or connect the compatible pairs as they see them. The ideas with this activity is to get students accustomed to seeing combinations that work together and then look for these combinations in mathematical problems.

Instructional Procedures

Shopping Spree

1. Explain to the students that in this activity they will be using compatible pairs that make ten to subtract their $10 bills. Ask the students if they have ever received money for a birthday or Christmas present. Ask a few students what they did with the money. Explain that they are going to play a game called "Shopping Spree," where the winner is the first person to spend all of their money.

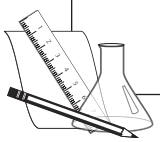
Materials

- ❑ *Place Value Mat*
- ❑ Play money
- ❑ *Shopping Spree*
- ❑ Tens cube

2. Group the students into pairs. To each student pass out a *Place Value Mat*; play money - ten $100 bills and fifteen $10 bills per student, a *Shopping Spree* recording sheet and a cube numbered 00–90.
3. Each student starts out with 10 $100 bills or $1,000. Students should place the money on the *Place Value Mat*. The students take turns rolling the number cube and taking away the dollar amounts equal to the number on the cube. Students need to trade their $100 bills to ten $10 bills to subtract.
4. If a student rolled 50 on his/her first roll then he/she would trade a hundred dollar bill for 10 ten-dollar bills. He or she would say $1,000 subtract $50.00 is $950 and write down that amount on the *Place Value Recording Sheet*.
5. Play continues until one of the students spends all of their money and the student's *Place Value Recording Sheet* is at 0. The goal of the game is to have students see compatible numbers 10 – 90, and also to use the strategy of "counting up" for subtraction.

Materials

- ❑ *Subtraction Strategies*
- ❑ Scissors



Two and Three Digit Subtraction Strategies

1. Pass out the *Subtraction Strategies* foldable to each student. Explain how to fold the paper and where to cut the flaps.
2. Model a subtraction problem and solve together using "Counting Up." Then have the students make up a problem on their own, write it on the opposite side of the flap, and solve it using the same method. Continue using the "Same Change" strategy.

Materials

- ❑ *Number cards*
- ❑ Small whiteboards
- ❑ Markers
- ❑ Calculators

Subtraction Showdown

1. Organize the students into groups of four.
2. Pass out a set of *Number cards*, three whiteboards with markers, and one calculator to each group.
3. One student is the caller and the other three students are problem solvers. The caller turns over two cards and makes a two-digit number. The caller turns over two more cards and makes another two-digit number. The greatest number is the minuend (first number or the number being reduced) and the second number is the subtrahend (second number or the number being taken away from another number) in the subtraction problem.

4. The three problem solvers write down the problem and solve it using any method that they want, and the caller uses the calculator to solve the problem. When everyone is done the caller calls out "Showdown," and the three students turn over their boards to show everyone their answers. If everyone is correct, the team celebrates. If someone makes a mistake then the team helps the student find his/her error and then everyone celebrates.
5. Everyone passes his or her equipment clockwise to the next person. The new caller repeats the same process and the problem solvers solve the new problem.

Assessment Suggestions

- Walk around the room while students are participating in the activities. Do they understand place value when they are playing Shopping Spree? Can the students find the difference to the next hundred? Do they understand place value and are they lining up their equations properly? Are they able to solve the problems? What strategies are they using most often?
- Have the students write in their journals one new thing that they learned from the activity.

Curriculum Extensions/Adaptations/ Integration

- For special needs learners, simplify Shopping Spree by using two 1-6 cubes and start with $100.
- Special needs students could use the digit cards 0-5 when playing Show Down.
- Have advanced learners make three-digit subtraction problems when playing Show Down.

Family Connections

- Write a note home to family members explaining that you will be teaching their children different strategies for subtraction before you teach the standard algorithm. Give parents some examples, and ask them to support you by helping their children learn these strategies too.
- Have students share their Subtraction Strategies foldable with family members.

Additional Resources

Books

Principles and Standards for School Mathematics, by National Council of Teachers of Mathematics; ISBN 9 780873534802

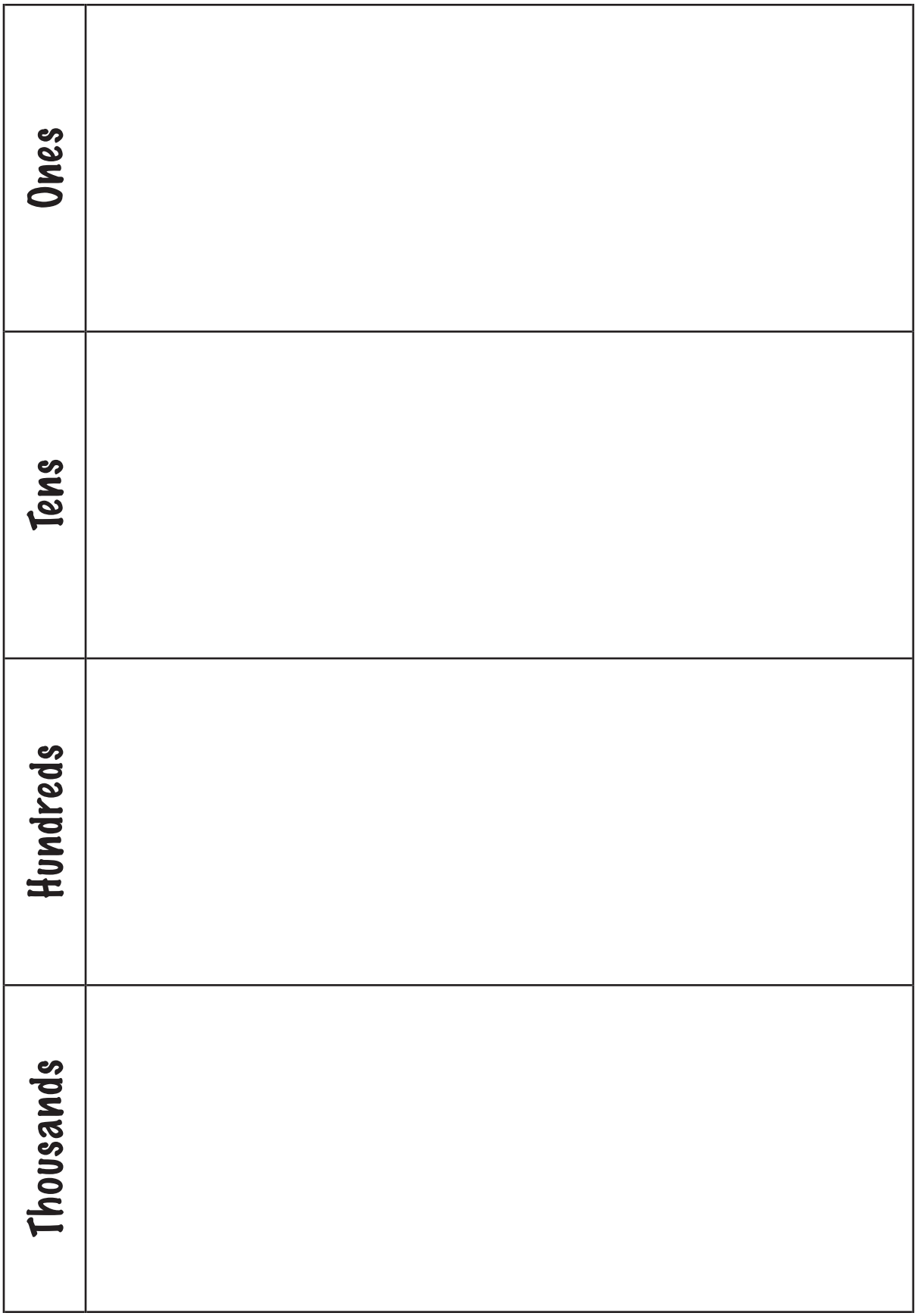
Developing Number Concepts; Place Value, Multiplication, and Division, Richardson, Kathy; ISBN 0-7690-0060-6 21882

Elementary and Middle School Mathematics; Teaching Developmentally, Van De Walle, John A.; ISBN 0-205-38689-X

Subtraction Strategies

Counting Up	Same Change

Place Value Mat



Shopping Spree Place Value Recording Sheet

Name _____

Th	H	T	O

Th	H	T	O

Shopping Spree Place Value Recording Sheet

Name _____

Th	H	T	O

Th	H	T	O

0-9 Number Cards

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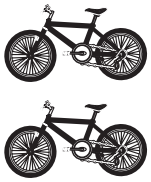
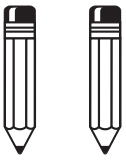
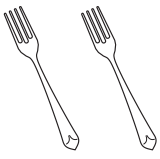
2 	2 	2 	2 

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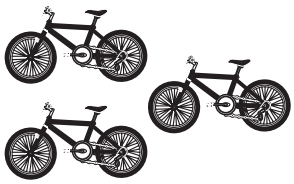
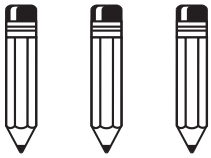
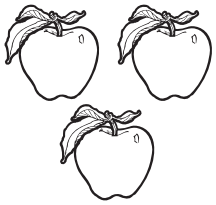
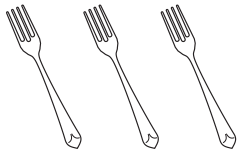
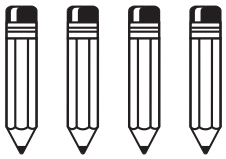
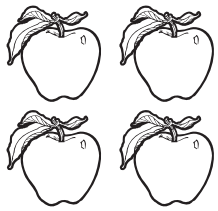
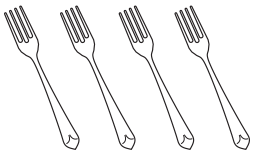
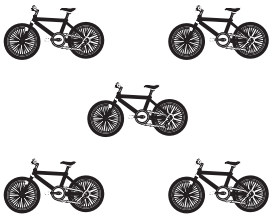
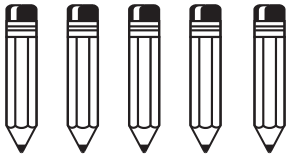
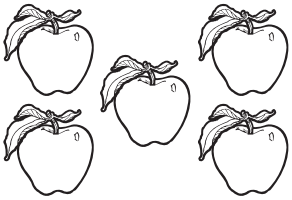
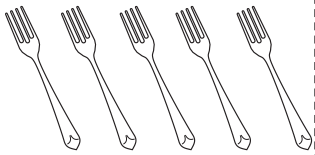
3 	3 	3 	3 
4 	4 	4 	4 
5 	5 	5 	5 

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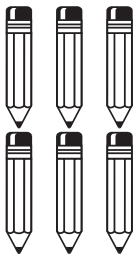
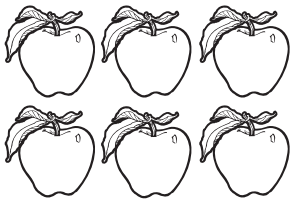
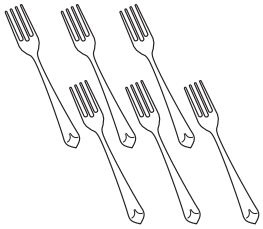
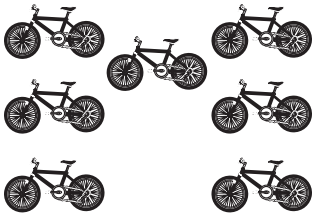
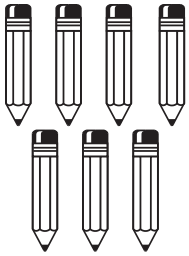
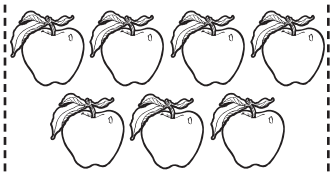
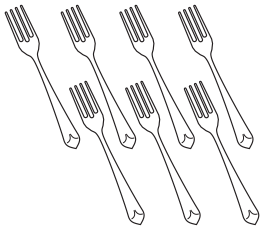
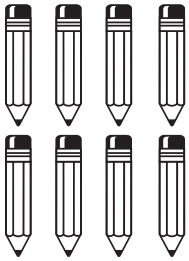
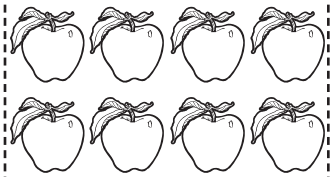
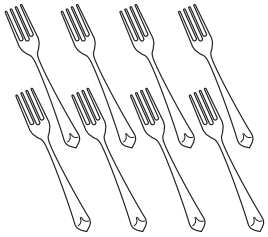
6 	6 	6 	6 
7 	7 	7 	7 
8 	8 	8 	8 

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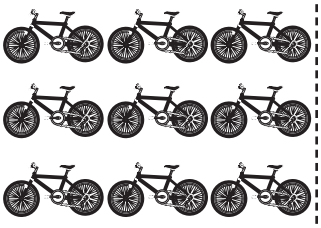
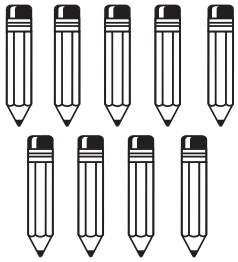
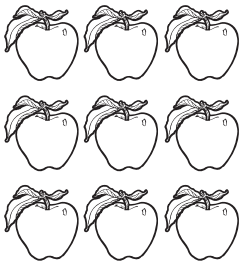
9 	9 	9 	9